The reference to University education occurs in the part of the memorandum which interprets what is meant by the words "persons of experience in education and of persons acquainted with the needs of the various kinds of schools." The interests which are always to be represented either among the members appointed from the council or among members appointed from outside the council are thus enumerated:—University education; the secondary education of boys and girls in its higher and lower grades; technical instruction and commercial and industrial education, having special regard to the industries of a particular district; the training of teachers; and elementary education in council schools and in voluntary schools.

The Board of Education evidently does not intend that the councils concerned with the appointment of education committees shall be allowed to lose sight of the needs of higher and secondary education. It is earnestly to be desired that men of science in all parts of the country will be willing to become members of these education committees, so that councils everywhere may be kept informed as to what must be done if, as a nation, we are to make up the leeway in our educational affairs as compared with those of, say, Germany and the United States.

NOTES.

THE Bakerian lecture of the Royal Society on Thursday next, February 26, will be delivered by Mr. C. T. Heycock, F.R.S., and Mr. F. H. Neville, F.R.S., on "Solid Solution and Chemical Transformation in the Bronzes."

WE regret to see the announcement that Mr. F. C. Penrose, F.R.S., died on Sunday last at the age of eighty-five. From an obituary notice in the *Times* we learn that Mr. Penrose was born at Bracebridge, near Lincoln, and, after four years at Bedford Grammar School, entered the foundation at Winchester College. At Cambridge he was a senior optime in the Mathematical Tripos in 1842, and for three years thereafter he held the appointment of Travelling Bachelor to the University. In 1851 he brought out, for the Society of Dilettanti, a work entitled "The Principles of Athenian Architecture," of which a second edition has been published. In the following year he was appointed Surveyor of the Fabric of St. Paul's Cathedral, a post which he held until 1897. He published in 1869 "A Method of Predicting Occultations of Stars and Solar Eclipses by Graphical Construction," of which a new edition was issued last year; and during 1893 he contributed to the *Transactions* of the Royal Society a paper on the astronomical significance of the orientation of Greek temples, which was followed by a supplement on the same subject in 1897. His last work was an endeavour to determine the age of Stonehenge by utilising the orientation theory combined with accurate measurement of the direction of the axis of the building. It is rarely that the scientific and artistic temperaments are found so closely united in one man. His death is a loss both to science and art, which will be widely felt.

AT the Cambridge Philosophical Society on February 2, the president, Dr. Baker, proposed from the chair, "That the Cambridge Philosophical Society desires to express its sense of the great loss sustained by the University and the Society in the death of Sir George Gabriel Stokes, to whom the Society was bound by so many ties of obligation and reverence." This was seconded by Prof. Thomson, and carried unanimously. The Society then adjourned, as a mark of respect to Stokes's memory.

AT a conference of botanists of Vienna held on December 9, 1902, the organising committee was elected for the International Botanical Conference which is to be held at Vienna in 1905. The officers of the committee are as follows:—Honorary presidents: Dr. Guillaume de Hartel, Minister of Public Instruction; Dr. Charles de Giovanelli, Minister of Agriculture; Prof. Edouard Suess. Presidents: Prof. Richard de Wettstein and Prof. Jules Wiesner. Vice-presidents: Prof. Edouard Hackel and Prof. Hans Molisch. General secretary: Dr. Alexander Zahlbruckner. Secretaries: Dr. Charles Linsbauer and Dr. Frédéric Vierhapper. Treasurer: Dr. Léopolde de Portheim. All communications concerning the congress should be addressed to the general secretary, Dr. A. Zahlbruckner, Vienne, I., Burgring 7.

THE biennial Hunterian Oration was delivered on the afternoon of February 14 by Sir Henry Howse, president of the Royal College of Science, in the theatre of the college. He devoted the greater part of his oration to interesting biographical incidents concerning John Hunter, who was elected a fellow of the Royal Society in 1767, and appointed surgeon-extraordinary to the King in 1776. The collection of the objects in his museum was Hunter's chief interest through many years of his life, and at his death there were 14,000 specimens in the museum, on which Hunter spent 70,000*l*. A banquet took place in the evening in the library of the college, at which the honorary fellowship of the college was conferred on Lord Roberts, who, in his reply, referred to the outbreaks of enteric fever at Bloemfontein and Kroonstad during the late war, and expressed his admiration for the way in which the medical officers managed to meet all emergencies with a minimum of appliances.

THE Rumford Committee of the American Academy of Arts and Sciences has made the following grants in aid of investigations in light and heat:—250 dollars to Dr. Ralph S. Minor, of Little Falls, N. Y., for a research on the dispersion and absorption of substances for ultra-violet radiation; 100 dollars to Dr. Sidney D. Townley, of Berkeley, Cal., for the construction of a stellar photometer of a type devised by Prof. E. C. Pickering and already in use in the study of the light of variable stars; 200 dollars to Prof. Edwin B. Frost, for the construction of a special lens for use in connection with the stellar spectrograph of the Yerkes Observatory to aid in the study of the radial velocities of faint stars; 250 dollars to Profs. E. F. Nichols and G. F. Hull, of Dartmouth College, for their research on the relative motion of the earth and the ether; 300 dollars to Prof. G. E. Hale, of the Yerkes Observatory, for the purchase of a Rowland concave grating to be used in the photographic study of the spectra of the brightest stars.

AT a meeting of the Royal Commission for the Exhibition of 1851, held on February 10, the Prince of Wales was unanimously elected president of the Commission in succession to His Majesty the King, who had held that position since the year 1870. In taking the chair, the Prince of Wales remarked:—"The history of the Commission seems a somewhat curious one. Originally appointed merely to carry out the great Exhibition of 1851, it was afterwards charged with the duty of disposing of the sum of 180,000*l*., the profit resulting from that Exhibition, a task which, in ordinary circumstances, might have been speedily completed. But the happy investment of the bulk of the money in the Kensington Gore estate gave the Commission a permanent character. The acquisition of the estate and its subsequent great increase in value has enabled the Commissioners to afford considerably more help in the promotion of science and the arts than could have been anticipated from the sum of money originally at their disposal. Without going into detail, the Commissioners are aware that their body, by granting sites for public institutions (in most cases gratuitously, in others on very liberal terms), by grants of money in aid of those institutions, and by scientific and educational scholarships administered by the Commission, have already carried out to a very large extent the trust of their charter."

PROF. H. G. SEELEY, F.R.S., has been elected a foreign correspondent of the Imperial Academy of Sciences, St. Petersburg.

PROF. FREDERICK W. PUTNAM, curator of the Peabody Museum, has been awarded the Lucy Wharton Drexel medal of the Franklin Institute of Philadelphia for his work in American archæology.

WE learn from *Science* that Dr. W. A. Cannon has been appointed resident investigator of the Desert Botanical Laboratory of the Carnegie Institution. Mr. Frederick V. Coville and Dr. D. T. MacDougal, of the advisory board of the laboratory, started on January 24 on a tour of inspection of the region west of the Pecos River, in Texas, along the Mexican boundary, for the purpose of fixing upon a site for the laboratory.

ON Tuesday next, February 24, Sir William Abney will deliver the first of a course of three lectures at the Royal Institution on "Recent Advances in Photographic Science." On February 26 Prof. L. C. Miall begins a course of three lectures on "Insect Contrivances," and on Saturday, February 28, Lord Rayleigh delivers the first of six lectures on "Light; its Origin and Nature." The Friday evening discourse on February 27 will be delivered by Mr. A. Liebmann on "Perfumes; Natural and Artificial"; on March 6 by Prof. J. G. McKendrick, on "Studies in Experimental Phonetics"; and on March 13 by Prof. Karl Pearson, on "Character Reading from External Signs."

THE Carnegie Institution has made a grant of four thousand dollars to the Yerkes Observatory, to be expended under the direction of Prof. George E. Hale, for certain researches in astronomy and astrophysics. These will comprise:—(1) A photographic investigation of stellar parallaxes; (2) investigations in stellar photometry; (3) a detailed study of several hundred photographs of the sun, taken with the spectroheliograph at the Kenwood Observatory in the years 1891–1896; (4) certain investigations in solar and stellar spectroscopy, to be undertaken by Prof. Hale as soon as the new horizontal reflecting telescope, recently injured by fire, has been completed.

THE funeral of the late Mr. James Glaisher, F.R.S., at Shirley, near Croydon, on February 11, was attended by a representative gathering of scientific men, as well as by many personal friends. Major MacMahon represented the Royal Society, and, on behalf of other societies and institutions, there were present, among others, Mr. F. W. Dyson, chief assistant of the Royal Observatory, Greenwich; Sir Charles Wilson, chairman of the executive committee of the Palestine Exploration Fund; Mr. W. Ellis, late of the Royal Observatory; Mr. W. Marriott, assistant secretary of the Royal Meteorological Society; Mr. Baldwin Latham and Mr. A. H. Baynes. Among the floral tributes were wreaths from Mr. W. N. Shaw, Secretary to the Meteorological Council; the Palestine Exploration Fund, the Aëronautical Society of Great Britain and the Aëronautical Society of Germany.

THE *Etoile Belge* states that an international exhibition will be opened at Liège in April, 1905. The exhibition, which will include a scientific section, is due to private initiative, but it has received the patronage of King Leopold, and has been promised the support of the Belgian Government.

IN their twelfth annual report, the committee of the Society for the Protection of Birds is able to announce a decided advance in the object for which it is striving. The Wild Birds Protection Act of 1902 has considerably aided the Society's efforts by making it lawful to confiscate the booty of offenders. The committee also notes with approbation the action of the Government of India in prohibiting the exportation of native birds' skins, except for natural history purposes. It cannot, of course, be hoped, observes the committee, that the action of a single Government will at once prevent ladies from wearing plumes in their hats, but it is nevertheless a step in the right direction. South America now appears to be one of the worst offenders in regard to bird-destruction, and it is, unfortunately, a region where there is, at present at all events, but little hope of repressive legislation being introduced. While noticing that in this country the Church has done little or nothing to aid the crusade, the report announces with satisfaction that the periodical Press has all along been on the side of the movement. "The fact of this great unfailing support, and the steady growth of this Society, inspires a hope that eventually the object which the first founders of the Society set before them thirteen years ago—namely, the suppression of this destructive fashion and trade—may be attained."

A PARAGRAPH appeared a short time ago in the *Times* recording some of the ornithological results of Mr. B. Alexander's recent expedition to Fernando Po. Mr. Alexander reached the island last December, and proceeded to explore the highlands of its northern portion, ascending Clarence Peak, which was found to be wooded to a height of between 10,000 and 11,000 feet. The novelties included in his bird-collection were described by himself at a meeting of the British Ornithologists' Club held on January 21, and are briefly described in *Bulletin* No. 44 of that body. The collection comprises nearly 400 specimens, referable to some sixty-eight species, of which no less than thirty-three are described as new. Nor is this all, for two of the species are assigned to new genera, under the names of Urolais and Poliolais. It is remarkable that the majority of the Fernando Po birds display little affinity to those of the adjacent West African lowlands, but are more nearly related to East African mountain types from Kilimanjaro and Mount Elgon. In addition to its peculiar birds, Fernando Po appears to possess a fauna and flora of great abundance and interest, the number of species of ferns at high altitudes being especially noticeable.

THE Geneva correspondent of the *Daily Mail* states that Count Zeppelin has just completed an automobile-launch which possesses the peculiarity of having its propellers in the air. According to the inventor, the launch will be of the greatest use in tropical lakes and rivers encumbered with aquatic plants, which, obstructing the screw, render an ordinary steam launch useless. The launch is extremely light, has a draught of only ten inches, and it skims the water at a rate varying from fourteen to sixteen miles an hour.

WE have received the first part of the new volume (vol. iii.) of the *Journal of Hygiene*, which contains several important papers. Dr. Jordan discusses the kinds of bacteria and their variation in river water. Dr. Longcope gives a study of the bacteriolytic action of human blood in disease, and Dr. Walker surveys the various factors in bacteriolytic action, from which he deduces the fact that the complement or addiment is a product of disintegration of leucocytes.

A new drug laboratory has, says the *British Medical Journal*, recently been established in the Chemical Bureau at Washington, with the object of investigating adulterations, testing drugs and establishing uniformity in the standard of medical substances for future State and national legislation. The American Pharmaceutical Association has passed resolutions approving of the new bureau.

The Glamorgan Sea Fisheries Committee, having decided to conduct an independent inquiry into the allegations respecting the pollution of Mumbles oysters, deputed Prof. Herdman to make the necessary investigations, and his report has now been published. Samples of the oysters and of the water were subjected to careful bacteriological investigation by Dr. Griffith, under Prof. Herdman's direction, and the final conclusion arrived at was that the shore, the water and the oysters all gave evidence of being polluted with sewage. Of the oysters, some were much more polluted than others.

At the meeting of the Institution of Civil Engineers on February 10, Mr. David Carnegie read a paper on the manufacture and efficiency of armour-piercing projectiles. The modern projectile is, he pointed out, composed of steel containing carbon, associated with one or more of the following metals:—nickel, chromium, manganese and molybdenum. Typical proportions per cent. of elements other than iron in shells which are air-hardened are:—carbon 0·80, silicon 0·2, sulphur 0·04, phosphorus 0·04, manganese 0·12, nickel 2·00 and chromium 2·00. In present-day methods of hardening, three mediums are used, viz. water, oil and air, and the choice of the method used is determined by the composition of the material to be hardened. Carbon steels are generally hardened in water, or partly in water and partly in oil; nickel steels in water, in oil, or in air under pressure; and steels having self-hardening properties by simply heating and allowing to cool in air.

The passage in Mr. Swinburne's presidential address to the Institution of Electrical Engineers in which he criticised the prevailing notions of the meaning and definition of the term "entropy" has given rise to an animated correspondence on the subject in the columns of the electrical and engineering papers, particularly in those of the *Electrician*. No apology is needed for directing the attention of readers of Nature to a controversy in which such distinguished men as Lord Kelvin, Sir Oliver Lodge, Prof. Poincaré and Prof. Planck have taken part, as well as the original disputants—Mr. Swinburne and Prof. Perry. The discussion does not seem to be ended yet, but we trust that when it is concluded Mr. Swinburne will not allow it to remain scattered in the columns of various journals, but will, as he himself has led us to hope, collect and republish the letters and articles. The collected statements of the views of so many authorities would be of great assistance to all students trying to grasp the full import of the second law of thermodynamics.

The paper on high temperature electrochemistry read by Messrs. R. S. Hutton and J. E. Petavel before the Manchester Section of the Institution of Electrical Engineers last November contains a most interesting and suggestive account of electric furnace work. The paper is divided into two parts, the first of which deals with the equipment of an experimental electrometallurgical laboratory. A description of the apparatus available at Owens College is given; the authors are certainly to be congratulated on having the opportunity of working in a laboratory so well equipped as this. Amongst other special apparatus may be noted a furnace capable of working with currents up to 1000 amperes under pressures up to 200 atmospheres. This furnace, which has been provided out of funds from the Government Grant Committee of the Royal Society, is intended to be used for research on the effect of gaseous pressure on high temperature chemical reactions. The second part of the paper consists of notes on technical processes, and in it the authors direct attention to the more important features of the various electric furnace processes in commercial operation at the present time.

Modern tendencies in the utilisation of power formed the subject of the address given by Prof. J. J. Flather to the Engineering and Mechanical Science Section of the American Association for the Advancement of Science. In the first part of the address the question of the distribution of power in workshops is considered, and the author deals at some length with the relative merits of electricity, compressed air and hydraulic pressure under various conditions. In the latter part of the paper Prof. Flather deals with some of the larger questions of power generation and transmission. He points out that the competition between oil, gas and steam engines, and steam turbines is likely to lead to the further development and perfecting of each for the purposes for which it is specially suitable. The paper contains some interesting data showing what has already been accomplished in the way of generating power by large gas engines and steam turbines.

The November issue of the *Proceedings* of the Philadelphia Academy contains an important paper, by Mr. W. H. Dall, on the American representatives of the bivalve group, Carditaceæ.

In the February number of the *Irish Naturalist* Prof. G. Wilson gives additional information with regard to the proposed marine laboratory for Ulster, to which allusion was made in the January issue of that journal. All concerned are agreed as to the need of such an institution, especially in connection with the Irish sea-fisheries, and the one difficulty in the way is the acquisition of the necessary funds.

A notable addition to the British (Natural History) Museum is a fine specimen—skin and skeleton—of the great Indian rhinoceros (*Rhinoceros unicornis*), presented by H.H. the Maharajah of Kuch-Behar. The mounted skin is placed for the present in the entrance hall.

Our German contemporary, *Naturwissenschaftliche Wochenschrift*, contains an illustrated article, by Dr. M. von Linden, on Eimer's theory of the evolution of colour-markings in animals. On this theory, it will be remembered, longitudinal striping is regarded as the first stage; from this spots are developed by a breaking-up process, and these again may coalesce to form vertical stripes.

Some weeks ago we noticed an article, by Prof. C. H. Eigenmann, on the development of American eels, in which attention was called to the practice of giving separate specific names to the larval "leptocephali." We have just received two papers on the life-history of American eels, issued in 1901 by the U.S. Fish and Fishery Commission, one by Mr. Eigenmann and the other by Messrs. Eigenmann and Kennedy. In the second of these it is confessed that the practice of naming leptocephali is an anachronism, although it is considered permissible in cases where the adult form cannot be identified.

Dr. Camillo Bosco contributes to the *Atti dei Lincei*, xi. 12, a study of the cranium of a beaver of the Quaternary period, found in the gravels of Maspino, near Arezzo, and now in the palæontological museum at Florence. This skull was referred by Forsyth Major and Rütimeyer to *Castor fiber*. It is much more closely related to the European than to the Canadian beaver, particularly in the shape of the nasal parts, the zygomatic arches, the breadth of the frontal and nasal regions, and the parietal crests; it differs, however, from both forms in the palate, which is much broader behind than before, the incisors, which are broader, and the molars, which decrease rapidly in size from the first to the last, and on the surface of which the folds of enamel are slightly sinuous. At the same time, the fact that the nasal bones have retained the same form and breadth during the geological intervals which have elapsed from the time of the Maspino beaver and the Pliocene specimen of Valdarno Superiore affords an argument in favour of the specific separation of *Castor fiber*, L., from *C. canadensis*, Kuhl.

M. L. HOULLEVIGUE describes in the *Journal de Physique* for January some interesting results obtained by depositing thin films of metal on glass and other surfaces by kathodic rays in a bell glass receiver. With deposits of palladium the moisture of the breath was sufficient to break up the film, and the same was to a less degree the case with platinum. In the case of copper, crystals of oxide commenced to form at the edges, and soon extended inwards, but the process was arrested before reaching the middle part, which was the thinnest portion of the pellicule. An attempt was made, extending over seven days, to obtain a carbon film, but the only deposit obtained was probably due to the copper of the support. The electric resistance of a film of bismuth obtained by projection was found to be insensible to a magnetic field. On the other hand, transparent laminæ of iron, placed normally to the field of a Ruhmkorff coil, afforded a ready illustration of magneto-optic rotation. In connection with this work, M. Ed. van Aubel calls attention to the investigations of Wright, Kundt, Patterson and J. J. Thomson.

"FACTORISATION of large numbers" is the subject of a paper read by Mr. F. J. Vaes, of Rotterdam, to the Amsterdam Academy of Sciences last year. The method which forms the starting-point of Mr. Vaes's paper consists in the expression of the given number as the difference of two squares. Taking, say, the number 513667, the next greater square is 717^2, and he writes $513667 = 717^2 - 422$. Then he increases the first and second terms of the difference in succession by $2.717+1$, $2.717+3$ . . ., that is, 1435, 1437, 1439 . . .; the results are thus $718^2 - 1857$, $719^2 - 3294$ . . . and when the second term is a perfect square, the factorisation will be completed. However, the work may be shortened by observing that a perfect square cannot end in 2, 3, 7 or 8, and further, the author gives a table of all the groups of four figures in which a square can end, by which further abbreviation appears possible. It is obvious that the process stops when the original number $2n+1$ is expressed in the form $(n+1)^2 - n^2$, and if a square has not been obtained previously, the number will be known to be prime.

REFERRING to Dr. E. H. Barton's letter, published in our last issue, describing a simple sensitive flame, Prof. W. F. Barrett, F.R.S., directs attention to a lecture delivered by him before the Royal Dublin Society on January 3, 1868, in which he thinks he used such a flame to demonstrate the reflection and refraction of sound.

THE short nature-studies written by Prof. L. C. Miall, F.R.S., and published under the title "The History of Aquatic Insects" by Messrs. Macmillan and Co., Ltd., in 1895, have been issued in a cheaper form at 3*s*. 6*d*. Advantage has been taken of the reissue to make a few emendations and additions. In its new form the book will doubtless secure a wide popularity in the classes for nature-study which are being instituted in many parts of the country.

MESSRS. GEORGE BELL AND SONS have published separately, at 2*s*. net, under the title "Webster's Pictorial Dictionary," the three thousand or more illustrations in "Webster's International Dictionary of the English Language." The pictures have been classified and arranged according to subjects. As was, perhaps, to have been expected, a very large proportion of the figures illustrate scientific subjects, and exceptional prominence seems to have been given to botanical and zoological terms.

A SECOND edition of "An Elementary Course of Infinitesimal Calculus," by Prof. Horace Lamb, F.R.S., has been issued by the Cambridge University Press. The book was first published in 1897, and a review of it appeared in NATURE for July 28, 1898. In the new edition the book has been carefully revised, and several errors have been corrected, principally in the examples. A few paragraphs in the latter portion of the book, relating to infinite series, have been amplified.

THE seventh volume of *The South-eastern Naturalist*, being the *Transactions* of the South-eastern Union of Scientific Societies for 1902, has been received. Amongst other interesting contents, the volume contains the presidential address, by Dr. Jonathan Hutchinson, F.R.S., on leprosy in the Middle Ages, and the following papers:—Miss A. L. Smith, on mycorhiza, the root-fungus; Mr. E. R. Harrison, on eolithic flint implements; Prof. G. S. Boulger, on the preservation of our indigenous flora; Mr. E. A. Martin, on the protection of plants; Mr. Sibert Saunders, on the marine aquarium, without circulation or change of water; and Mr. W. Whitaker, F.R.S., on Kentish wells and deep borings in the neighbourhood of Canterbury. The report of this union of scientific societies, with which the publication begins, is of a highly satisfactory character, and the record of the work accomplished, or now being done, by members of the affiliated societies shows a very creditable activity on the part of the union.

THE International Oxy-Generator Syndicate, Ltd., has submitted to us for examination a simple and convenient form of apparatus for the manufacture of oxygen, known as the "'Ever Ready' Portable Automatic Oxygen Generator." The apparatus consists of a steel tube used as a retort, a spirit lamp for heating the retort, a purifying tank for washing and cooling the gas, an automatic travelling stage, a collapsible gas holder for storing the gas, and all the necessary connections. The whole of the parts pack easily into a case of moderate size, and there are no complications to get out of order or to puzzle the novice. The oxygen is obtained in the usual manner by heating a mixture of potassium chlorate and manganese dioxide. As a means of avoiding the difficulties of procuring cylinders of compressed oxygen in out-of-the-way places, this generator should prove very useful.

IN the *Proceedings* of the American Academy of Arts and Sciences, vol. xxxviii. No. 5, T. W. Richards has published a simple method of gas-analysis which requires only the simplest apparatus and yet is capable of yielding results accurate enough for many ordinary purposes. The actual measurement consists in a determination of the pressure, the volume of the gas being kept constant. As an elementary exercise for students, the use of such a simple apparatus possesses many advantages over the ordinary gas apparatus employed in practice.

THE epidiascope, a new optical lantern, which we have examined at the London branch of Mr. Carl Zeiss, of Jena, is primarily intended for the projection on the screen of opaque bodies, such as insects, coins, fossils, diagrams, &c., in their natural colours. It is equally serviceable for projection of transparent objects, *e.g.* lantern slides, and microscopic preparations can likewise be shown with considerable magnification. The source of light is an arc-lamp of 30 or 50 amperes, at the focus of a parabolic reflector; the light is either thrown upon, or transmitted through, the object by a system of condensers and mirrors. The images are brilliant and well-defined. In its primary capacity the lantern gives remarkably interesting results, the images, for instance, of butterflies or coins being most realistic in appearance, owing, no doubt, to the fact that the shadows of the objects viewed are reproduced just as in nature. Dark heat rays are trapped by a water tank, so that delicate biological specimens, and even living organisms, may be depicted on the screen. A notable feature of the instrument is its convenience in manipulation, the change from opaque to transparent bodies taking but a few seconds. The object chamber is large, and objects are laid on a horizontal table without clamping. Manuscripts and pictures so large as 8½ inches square can be shown, hence the instrument should be useful, not only to men of science, but for class lectures and educational purposes.

WE have received the *Proceedings* of the University of Durham Philosophical Society, vol. ii. part ii. Amongst other papers is an interesting communication by Prof. P. P. Bedson on the gases enclosed in coal. The gases enclosed in the various samples of coal or coal dust were obtained by heating weighed quantities of these in tubes connected to a Sprengel pump and heated usually to 100° C. by means of boiling water. In addition to marsh gas, carbon dioxide, oxygen and nitrogen, evidence has been obtained of the occurrence of the higher hydrocarbons ethane and propane. These latter are not evolved so readily at 100° C. *in vacuo* as marsh gas, and a partial separation of the hydrocarbons can be effected on the basis of this property. Another point of interest in the paper is the experimentally established fact that coal, after removal from the mine, not only gives off some of its "enclosed gases," but takes up the gases of the atmosphere and the oxygen more readily than the nitrogen.

THE annual report for 1901 of the Smithsonian Institution at Washington has reached us. Although many details of interest are described in Prof. Langley's report, most readers will turn with the greatest pleasure to the valuable appendix of nearly 600 pages. This appendix is a summary of the most interesting scientific work of the preceding year, presented in a form which will appeal, not to men of science alone, but to the intelligent general reader. It contains fifty articles by men of science of many nationalities, most of them profusely and excellently illustrated. The first article gives a short sketch of the history and work of the Smithsonian Institution, and this is followed by one by Mr. Abbot on some recent astronomical events. Prof. Rücker's presidential address to the British Association at Glasgow is reprinted, as well as a number of Royal Institution lectures. Among these are that of Prof. Poynting on recent studies in gravitation, Prof. Dewar's on solid hydrogen, Mr. Marconi's on wireless telegraphy and Dr. Glazebrook's on the aims of the National Physical Laboratory. Numerous other interesting contributions include that by Lord Kelvin on ether and gravitational matter through infinite space, one by Prof. J. J. Thomson on bodies smaller than atoms, and several by Prof. S. P. Langley—that which appeared first in NATURE, on "The Fire Walk Ceremony in Tahiti," is one of them; while another shows the comparative efficiency as flying machines of various large birds and artificial aërodromes. There are also papers on the utilisation of the sun's energy, the Bogoslof volcanoes of Alaska, forest destruction, irrigation, pictures by prehistoric cave-dwellers in France, and one on the National Zoological Park at Washington by Mr. Seton Thompson. Several beautiful coloured plates add to the attractiveness of the volume.

THE additions to the Zoological Society's Gardens during the past week include two Coquerel's Mouse Lemurs (*Chirogaleus coquereli*) from Madagascar, a Mohr Gazelle (*Gazella mohr*) from North Africa, two Gould's Monitors (*Varanus gouldi*), six Bearded Lizards (*Amphibolurus barbatus*) from Australia, a Tamandua Anteater (*Tamandua tetradactyla*) from South America, deposited; a Common Stoat (*Mustela erminea*), European, purchased.

CORRECTION.—In line nine from the end of Mr. G. W. Butler's letter in NATURE of February 12 (p. 344), omit the word *of*.

OUR ASTRONOMICAL COLUMN.

OBSERVATIONS OF COMET 1903 *a*.—M. P. Chofardet, of the Besançon Observatory, records in the *Comptes rendus* for January 26 that on January 21 the apparent diameter of this comet was 1′·5 and its magnitude was about 10–11; a small eccentric condensation towards the south was also observed. On January 24 the condensation was central, and a small stellar nucleus was seen.

DETERMINATIONS OF STELLAR RADIAL VELOCITIES.—As a supplement to a previous note on the determinations of the radial velocities of the planets made at Meudon, M. Deslandres contributes to No. 4 (1903) of the *Comptes rendus* the results of the determinations of the radial velocities of θ Aquilæ, φ Persei and ψ Persei, and he also describes the spectrograph with which they were determined, together with the sources of error to which the determinations are subject.

In the case of θ Aquilæ (a white star of Pickering's class vii*a*.), where the hydrogen lines are broad and the metallic lines fine, the magnesium line λ 4481 was used. The results show a considerable variation in the velocity, and a mean period of about seventeen days with a shorter period of three days superimposed; the star is a spectroscopic binary.

The star φ Persei has bright hydrogen lines which show central reversals, and the fine dark reversals have been used in determining the velocity, which is variable.

In ψ Persei, the hydrogen lines are bright and superimposed on very broad dark lines, and each shows several dark reversals some distance apart, exactly similar in appearance to those seen in Nova Persei and other temporary stars.

For the comparison spectrum in each case, a spark from poles containing iron and titanium was used.

THE COLOUR OF THE ECLIPSED MOON.—In a description of the phenomena observed during the lunar eclipse of October 16, 1902 (*Astronomische Nachrichten*, No. 3845), Prof. E. E. Barnard comments on the various colours assumed by the eclipsed moon at different eclipses. He says that the appearance of the lunar surface during the last eclipse was by far the darkest he has yet observed, being of a dull coppery red colour, whilst that of June 11, 1881, was a beautiful bright cherry red, and suggests that this variation is probably due to the differences existing in the terrestrial atmospheric conditions during the various eclipses.

Prof. Barnard further remarks that the dark coloration is not evenly distributed during an eclipse, for in the present case he observed a dark smear running from east to west across the eclipsed moon, and he suggests that this phenomenon was probably due to some local disturbance in our atmosphere at the time of the eclipse.